

WHAT IS CLAIMED IS:

1. An image forming apparatus comprising:
  - an image bearing member;
  - charging means, to which a voltage including an
  - 5 AC voltage is applied, for charging the image bearing member;
  - control means for controlling a peak-to-peak voltage of the AC voltage;
  - developing means for developing an
  - 10 electrostatic latent image formed on the image bearing member with a developer; and
  - residual charge eliminating means for conducting charge elimination on the image bearing member,
  - 15 wherein the control means controls the peak-to-peak voltage of the AC voltage which is applied to the charging means during an image forming period on the basis of an AC current flowing when applying the AC voltage including the peak-to-peak voltage that is
  - 20 twice or less than a discharge start voltage  $V_{th}$  of the image bearing member to the charging means during a non-image forming period, and
  - the residual charge eliminating means conducts charge elimination on an area on the image bearing
  - 25 member that passes through a charging position of the charging means when applying the AC voltage including the peak-to-peak voltage that is twice or less than

the discharge start voltage  $V_{th}$  of the image bearing member to the charging means.

2. An image forming apparatus according to  
5 claim 1, wherein the control means controls the peak-to-peak voltage of the AC voltage which is applied to the charging means during an image forming period on the basis of the AC current and the AC current  
10 flowing when applying the AC voltage including the peak-to-peak voltage that is twice or more than the discharge start voltage  $V_{th}$  of the image bearing member to the charging means during a non-image forming period.

15 3. An image forming apparatus according to claim 2, wherein when applying the AC voltage including the peak-to-peak voltage that is twice or more than the discharge start voltage  $V_{th}$  to the charging means during the non-image forming period, a  
20 voltage value of a DC voltage applied to the charging means is 0V.

4. An image forming apparatus according to  
claim 1, wherein while the area on the image bearing  
25 member is in a developing position of the developing means, a voltage of such a level that a toner of the developer is not adhered to the image bearing member

from the developing means, is applied to the developing means.

5        5. An image forming apparatus according to claim 1, wherein while the area on the image bearing member is in a developing position of the developing means, a voltage applied to the developing means is 0V.

10       6. An image forming apparatus according to claim 3, wherein while the area on the image bearing member and an area on the image bearing member that is charged by the charging means when the AC voltage including the peak-to-peak voltage that is twice or  
15       larger than the discharge start voltage  $V_{th}$  of the image bearing member is applied to the charging means during the non-image forming period, are in a developing position of the developing means, a voltage applied to the developing means is fixed.

20

      7. An image forming apparatus according to claim 3, wherein while the area on the image bearing member and an area on the image bearing member that is charged by the charging means when the AC voltage  
25       including the peak-to-peak voltage that is twice or larger than the discharge start voltage  $V_{th}$  of the image bearing member is applied to the charging means

during the non-image forming period, are in a developing position of the developing means, a voltage applied to the developing means is 0V.

5           8. An image forming apparatus according to claim 1, wherein the peak-to-peak voltage of the AC voltage which is applied to the charging means during the image forming period is twice or larger than  $V_{th}$ .

10           9. An image forming apparatus according to claim 1, wherein the non-image forming period is a preparatory rotation period of the image bearing member before executing an image formation.

15           10. An image forming apparatus according to claim 1, wherein the residual charge eliminating means is electrostatic latent image forming means for forming an electrostatic latent image on a surface of the image bearing member that is charged by the  
20 charging means.

          11. An image forming apparatus according to claim 10, wherein the image bearing member is a photosensitive member, and  
25           the residual charge eliminating means is exposure means for conducting exposure on the image bearing member in order to form the electrostatic

latent image on the surface of the image bearing member that is charged by the charging means.

12. An image forming apparatus according to  
5 claim 1, wherein the residual charge eliminating means conducts charge elimination on the image bearing member on a downstream side of the charging means and an upstream side of the developing means with respect to a moving direction of the image  
10 bearing member.

13. An image forming apparatus according to claim 1, wherein the developing means doubles as cleaning means for collecting the developer remaining  
15 on a surface of the image bearing member.

14. An image forming apparatus according to claim 1, further comprising transferring means for transferring, onto a material to be transferred, an  
20 image that is formed on the image bearing member with the developer.

15. An image forming apparatus according to claim 14, wherein the transferring means doubles as  
25 cleaning means for collecting the developer remaining on a surface of the image bearing member.

16. An image forming apparatus according to claim 1, further comprising developer charging quantity control means, disposed further upstream than the charging means and further downstream than the transferring means with respect to the moving direction of the image bearing member, for applying a DC voltage in order to charge a residual developer remaining on the image bearing member to a normal polarity of the developer.

10

17. An image forming apparatus according to claim 1, wherein the charging means is brought into contact with the image bearing member to charge the image bearing member.

15

18. An image forming apparatus according to claim 1, wherein the charging means conducts charging by causing discharge between the charging means and the image bearing member.

20

19. An image forming apparatus according to claim 1, wherein the developing means performs developing by bringing the developer on the developing means into contact with the image bearing member.

25